L 17616-63 EWT(1)/EWG(k)/EDS/EEC(b)-2 AFFTC/ASD/ESD-3/AFWL/IJP(C)/SSD
Pz-4/P1-4/Po-4 AT S/056/63/044/003/023/053

74

AUTHOR: Mikhaylovskiy, A. B. and Rudakov, L. I.

TITLE: Stability of a spatially inhomogeneous plasma in a magnetic field

PERIODICAL: Zhurnal eksperimental'noy i tekhnicheskoy fiziki, v. 44, no. 3, 1963, 912-918

TEXT: There exist two groups of possible approaches to the questions connected with the stability of the plasma. One can investigate either the time development of initial perturbations, or one can search for the (generally complex) frequencies of self-oscillations. The authors investigated the stability and the oscillations of the plasma in a magnetic field assuming that the pertubed quantities vary slowly in the direction of plasma inhomogeneity. Consequently, they neglected small terms containing the space derivatives and obtained algebraic equations which yielded the frequency as function of coordinates. However, they did not assume the ion Larmor radius small relative to the wave length. The analysis is carried out for the particular case of small pressure infinite plasma layer in a homogeneous magnetic field (the problem is of importance for the magnetic isolation of the

Card 1/2

L 17616-63 S/056/63/044/003/023/053 0

Stability of spacially inhomogeneous plasma...

plasma). The kinetic equation is used and collisions are neglected. It is shown that in a plasma with an inhomogeneous density and temperature, perturbations exist which are unstable for infinitesimal inhomogeneities and arbitrary relative values of the density and temperature gradients (in this sense the instability is universal). Perturbations, with a wave length along the magnetic field larger than the characteristic length of density or temperature change s, turn out to be unstable. The transverse wave length of the most unstable perturbations disturbances is of the order or smaller thant the ion Larmor radius. Ion-acoustic and Alfven oscillations which move in a direction almost perpendicular to the magnetic field correspond to such disturbances in a homogeneous plasma. The maximum increment of the instability is $(T_i/Ma^2)^{\frac{1}{2}}$ (M = ion mass). There are 4 figures.

SUBMITTED: June 9, 1962
November 14, 1962 (supplement added)

Card 2/2

AID Nr. 981-15 3 June

CYCLOTRON INSTABILITY OF INHOMOGENEOUS PLASMA (USSR)

Mikhaylovskiy, A. B., and A. V. Timofeyev, Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 3, Mar 1963, 919-921.

S/056/63/044/003/024/053

Longitudinal oscillations of inhomogeneous plasma are analytically investigated at low plasma pressures and at frequencies which are multiples of ionic cyclotron frequencies. The dispersion equations, which represent the generalization of the Rosenbluth, Krall, and Rostoker equation, are investigated for the presence of ion-induced cyclotron harmonics under the assumption that electron temperature is zero and that the wave is propagated transversely to a magnetic field. The analysis shows that instability is present whenever the oscillation frequency is close to any integral multiple of the cyclotron frequency. In such a case the waves are unstable whether they propagate in the direction of electron drift or in the direction of ion drift. [VG]

Card 1/1

L 10505-63 EWT(1)/EWG(k)/BDS/EEC(b)-2/ES(w)-2--AFFTC/AFWL/ASD/ESD-3/
SSD--Pz-4/Pl-4/Po-4/Pab-4--AT/IJP(C)
ACCESSION NR: AP3000048 S/0056/63/044/005/1552/1561

AUTHOR: Mikhaylovskiy, A. B.

81
79

TITLE: Transverse drift oscillations of inhomogeneous plasma

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 5, 1963, 1552-1561

TOPIC TAGS: inhomogeneous plasma, transverse wave propagation

ABSTRACT: A theoretical investigation shows that "transverse drift oscillations," i.e., waves with a frequency less than the plasma frequency and with a wave vector perpendicular to an external magnetic field, can exist in an inhomogeneous plasma. The oscillation properties were investigated by solving a differential equation somewhat analogous to Schrödinger's equation describing such waves and by making use of the dielectric permittivity tensor. The solutions obtained for various simple cases indicate that transverse drift oscillations are localized in areas where plasma pressure is not uniform. It was found that oscillation phase velocity depends to a considerable extent on the velocity of Larmor

Card 1/2

L 10505-63
ACCESSION NR: AP3000048 2

electron drift and that a quasi-classical approach is justified in the study of waves possessing a fine structure in the direction of the inhomogeneity. The drift oscillations were found to be a limiting case of ionic-acoustical oscillations of an inhomogeneous plasma. "In conclusion I express my thanks to V. D. Shafranov for his constant attention to the work and useful advice, and to A. A. Vedenov for valuable remarks." Orig. art. has: 1 figure and 41 formulas.

ASSOCIATION: none

SUBMITTED: 29Oct62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NO REF SOV: 008 OTHER: 000

Card 2/2

MIKHAYLOVSKAYA, L.V.; MIKHAYLOVSKIY, A.B.

Drift instability of a dense plasma. Zhur. eksp. i teor. fiz. 45 no.5:1566-1571 N '63. (MIRA 17:1)

L 10834-63 BDS
ACCESSION NR: AP3000746 S/0020/63/150/003/0531/0532

50

AUTHOR: Mikhaylovskaya, L. V.; Mikhaylovskiy, A. B.

TITLE: Suydam instability at finite ionic Larmor radius

SOURCE: AN SSSR. Doklady, v. 150, no. 3, 1963, 531-532

TOPIC TAGS: finite Larmor radius, plasma in magnetic field, plasma instability, helical magnetic field, magneto-hydrodynamic approximation

ABSTRACT: V. R. Suydam (Proceedings 2nd International Conference on Peaceful Uses of Atomic Energy, Geneva, 1958; selected reports of foreign scientists, Moscow, 1959, page 89) has shown that plasma retained by a helical magnetic field is unstable with respect to certain periodic perturbations. This result was obtained in a magneto-hydrodynamic approximation when the frequency of perturbations is considerably smaller than the cyclotron ionic frequency, and the ionic Larmor radius is much smaller than the perturbation wavelength. The present work deals with the case of a finite ionic Larmor radius. It is shown that, for a sufficiently large ionic Larmor radius, there is a stabilizing effect on the plasma. "We express our appreciation to V. D. Shafranov for suggesting the problem and for attention to this work. Orig. art. has: 9 formulas.

Card 1/2

L 2:083-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2 Pz-6/
Po-1/Pab-10/P1-4 IJP(c) AT
ACCESSION NR: AP5001850 S/0056/64/047/006/2266/2268

AUTHOR: Kadomtsev, B. B.; Mikhaylovskiy, A. B.; Timofeyev, A. V.

TITLE: Negative energy waves in dispersive media

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 6, 1964, 2266-2268

TOPIC TAGS: negative energy wave, dispersive medium, plasma wave, ionized plasma, plasma conductivity

ABSTRACT: It is shown that nonequilibrium transparent media can exhibit anomalous dispersion, in which case the energy of a monochromatic electromagnetic wave can become negative, i.e., the energy of the medium is lower in the presence of the wave than in its absence. An example of such a medium is a plasma in a magnetic field with a configuration that is either anisotropic (with beams) or spatially inhomogeneous. Another example is an inhomogeneous plasma in a strong magnetic field with Maxwellian electron and ion distributions. A negative-energy wave can exhibit many unusual features when it interacts with matter or with other waves. For example, introduction of ordinary dissipation does not lead to time-attenuation

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L 23083-65
ACCESSION NR: AP5001850

of the wave, but to growth. A similar amplification effect arises when the wave is reflected from the boundary of a medium in which the dispersion is of the opposite sign. Related effects are the reflection of a sound wave from a supersonic stream, and the production of pairs of waves with positive and negative energy on a disturbed surface with infinite reflection coefficient (Cerenkov emission of sound waves) or in an infinite plasma at rest when the dispersion equation has multiple roots. It is shown by an example that negative energy can be excited if the directed velocity of electrons in a weakly ionized plasma in a longitudinal electric field is much smaller than the thermal conductivity. Negative energy effects can also be produced by nonlinear interactions between waves. Cases when the negative-energy effect is only apparent and can be removed by conversion to another coordinate system are discussed. Orig. art. has: 4 figures. [02]

ASSOCIATION: None

SUBMITTED: 23Jun64 ENCL: 00 SUB CODE: ME, GP

NO REF SOV: 005 OTHER: 000 ATD PRESS: 3173

Card 2/2

S/0020/64/156/001/0064/0066

ACCESSION NR: AP4035811

AUTHOR: Mikhaylovskiy, A. B.; Pogutse, O. P.

TITLE: Effect of Collisions on the Drift Instability of Plasma at Finite Larmor Ion Radius

SOURCE: AN SSSR. Doklady*, v. 156, no. 1, 1964, 64-66

TOPIC TAGS: plasma particle collision, plasma drift instability, ion Larmor radius, integration method, plasma particle kinetic equation, Larmor radius

ABSTRACT: The method of integration along trajectonis for the solution of the kinetic equation for plasma particles was very successful in the investigations of oscillations of nonuniform plasma. Until now, it was used only in cases in which collisions between particles were n t essential. The authors extend the method to problems in which the collisior are important. They introduce into the kinetic equation a collision term of the kind given by P. L. Batnagar et al (Phys. Rev. 94, 511 (1954)). This term permits a qualitative discussion of the effect of collisions. It follows for a finite (in comparison with the wavelength) Larmor radius and a free path for particles smaller than the longitudinal

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ACCESSION NR: AP4035811

wavelength, that the importance of ion - ion collision increases with the decrease of the perturbation wavelength. This increases the stability. If the collisions are numerous, short wave perturbations are not excited, as a result of ionic viscosity. Orig. art. has: 1 figure, 8 equations.

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova Akademii nauk SSSR (Institute of Atomic Energy Academy of Sciences SSSR)

SUBMITTED: 29Oct63 DATE ACQ: 26May64 ENCL: 00

SUB CODE. ME NO REF SOV: 003 OTHER: 001

Card 2/2

L 14382-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2
Po-4/Pz-6/Pab-10/Pi-4 IJP(c)/BSD(b)/APWL/ESD/AEDC(b)/ASD(p)-3/APETR/
ACCESSION NR: AP4047945 RAEM(a)/ESD(ga)/ S/0020/64/158/005/1068/1071
ESD(t) AT

AUTHOR: Mikhaylovskiy, A. B.

TITLE: Nonlinear theory of drift-cyclotron instability of non-isothermal plasma 21

SOURCE: AN SSSR. Doklady*, v. 158, no. 5, 1964, 1068-1071

TOPIC TAGS: plasma instability, nonlinear theory, drift instability, cyclotron instability

ABSTRACT: Earlier investigations of cyclotron instability were based only on linearized equations. The author consequently derives and analyzes equations for a plasma with $T_e \gg T_i$ (T_e, T_i -- electron and ion temperatures). The method used to derive the equations is that of B. B. Kadomtsev (ZhETF v. 45, 1230, 1963). The charge densities are determined and substituted in the Poisson equation, after which a chain of equations is set up in standard fashion for the

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L 14382-65
ACCESSION NR: AP4047945

2

correlation functions. This chain is terminated by substituting the product of pair correlations for the four-fold correlation function. It is shown that the cyclotron oscillations are unstable if the electron drift velocity exceeds the phase velocity of the wave. The intensity of the stationary cyclotron oscillations and their diffusion are estimated. "I thank B. B. Kadomtsev for useful advice and a discussion of the results." This report was presented by M. A. Leontovich. Orig. art. has: 21 formulas.

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova Akademii nauk SSSR (Institute of Atomic Energy, Academy of Sciences SSSR)

SUBMITTED: 19Mar64 ENCL: 00

SUB CODE: ME NR REF SOV: 005 OTHER: 000

Card 2/2

MIKHAYLOVSKIY, A.B.; STEPANOV, K.N.

Soviet physicists visiting England. Atom. energ. 19 no.2, 211-212 Ag '65. (MIRA 18:9)

L 10656-66 EWT(1)/ETC/EPF(n)-2/EWG(m) IJP(c) AT

ACC NR: AP5026306 SOURCE CODE: UR/0057/65/035/011/1933/1944

AUTHOR: Mikhaylovskiy, A.B. 44,55

ORG: None

56
50
B

TITLE: On the theory of the stability of a spatially nonuniform current in a plasma. 1. Low frequency waves

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 11, 1965, 1933-1944

TOPIC TAGS: plasma instability/plasma oscillation, plasma beam interaction, plasma magnetic field, nonuniform plasma, helical magnetic field.

ABSTRACT: The author discusses the stability of a plasma 21,44,55 carrying a spatially nonuniform electron current in a strong uniform longitudinal magnetic field. A dispersion equation for irrotational waves with frequencies small compared with the ion Larmor frequency is derived in a "quasiclassical" approximation under the assumptions that collisions and the thermal motions of the ions can be neglected. It is found that if the inhomogeneity is sufficiently pronounced the plasma is unstable, owing to the coupling, due to the inhomogeneity, between the transverse drift of the plasma and the longitudinal current. It is shown that the current-convective instability discussed by B.B.Kadomtsev and A.V.Nedospasov (J.Nucl.Energy, P.C. 1, 230, 1960) and the present instability (which is accordingly called the "collision free current-convective instability"), are different limiting cases of a single more general type of instability in an inhomogeneous plasma carrying a current. There

Card 1/2 UDC: 533.9

L 10656-66

ACC NR: AP5028306

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is an analogy between collision free current-convective instability and flute instability, stemming from the fact that (different) charge transport mechanisms are operative in both cases. The logarithmic increment of the current-convective instability can considerably exceed that of the flute instability even when the velocity of the relative motion giving rise to the current is comparatively low, of the order of the ion thermal velocity. An approximate upper bound is derived for the frequency of the oscillations resulting from the current-convective instability. The effect of including the thermal motions of the electrons and ions is discussed briefly. It is shown that shearing of the lines of force of the external magnetic field (as in the case of a helical field) together with a finite Larmor radius of the ions tends completely to suppress the current-convective instability. The author thanks B.B. Kadomtsev for discussing the results and M.V.Nezlin for a stimulating discussion. Orig. art. has: 59 formulas and 1 figure. 44,55

SUB CODE: 20 SUBM DATE: 04Feb66/ ORIG.REF: 010 OTH REF: 001

HW

Card 2/2

L 10657-66 EWT(l)/ETC/EPF(n)-2/EWG(m) IJP(c) AT

ACC NR: AP5028307 SOURCE CODE: UR/0057/65/035/011/1945/1959

AUTHOR: Mikhaylovskiy, A.B.

ORG: none

TITLE: On the theory of the stability of a spatially nonuniform current in a plasma. 2. Waves with frequencies higher than the ion Larmor frequency

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 11, 1965, 1945-1959

TOPIC TAGS: plasma instability, plasma oscillation, plasma beam interaction, plasma magnetic field, nonuniform plasma, plasma wave

ABSTRACT: The discussion begun in the previous paper (A.B.Mikhaylovskiy, ZhTF 35, 1933 1965 (see Abstract AP5028306) of the stability of a plasma carrying a spatially nonuniform electron current in a strong uniform longitudinal magnetic field is extended to include the excitation of oscillations with frequencies higher than the ion Larmor frequency. It is shown that such oscillations can be excited only when the velocity of the beam electrons with respect to the plasma exceeds the phase velocity of the waves. The dispersion equation is derived for the case of an electron beam with a rectangular velocity distribution and the conditions for instability are obtained. The mechanism underlying the instability is discussed in some detail. The instability involves transport of the charge of the electron beam by drift in the external magnetic field and the transverse component of the electric field of the perturbation;

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ACC NR: AP5028307

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the instability is accordingly analogous to the low frequency collision free current-convective instability discussed in the preceeding paper (loc.cit.). The case of an axially symmetric monoenergetic beam whose density is proportional to $1 - (r/a)^2$ is solved (here r is the distance from the axis and a is a constant). If the cold plasma is also inhomogeneous (with the same radial dependence of the density) and is sufficiently dense, the system is no longer unstable. The boundary conditions at plane electrodes are introduced and the discrete spectrum of standing waves and their stability are discussed. Relaxing the requirement that the beam be monoenergetic alters the results only slightly, for the instability under discussion is much more sensitive to the spatial distribution of the beam than to its velocity distribution. In the final section there are discussed kinetic effects due to resonance particles with velocities close to the phase velocity of the waves. The author thanks B.B. Kadomtsev for discussing the results and M.V. Nezlin for a stimulating discussion. 44,55 44,55

Orig.art. has: 79 formulas.

SUB CODE: 20 SUBM DATE: 04Feb65/ ORIG. REF: 007 OTH REF: 004

HW

Card 2/2

L 13452-66 EWT(1)/ETC(F)/EPF(n)-2/EWG(m) IJP(c) AT

ACC NR: AP6002435 SOURCE CODE: UR/0057/65/035/012/2143/2149

AUTHOR: Mikhaylovskiy,A.B.; Rukhadze,A.A.

ORG: Physics Institute im. P.N.Lebedev, Moscow (Fizicheskiy institut)

TITLE: Instability of electronic waves in nonuniform plasma streams

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no. 12, 1965, 2143-2149

TOPIC TAGS: plasma instability, plasma magnetic field, moving plasma, nonuniform plasma, plasma electron oscillation, charged particle

ABSTRACT: The authors calculate the effect of convective drift of charged particles on the high frequency slipping instability of a nonuniform plasma carrying a current in an external magnetic field, discussed by E.Harrison and E.Harrison & T.Stinger (Proc.Phys. Soc. B82, 689, 700, 1963) with neglect of drift. The equation for small potential oscillations in a cold nonuniform current-carrying plasma in which the current is parallel and the gradients are perpendicular to an external magnetic field is quoted from work of A.B.Mikhaylovskiy (ZhETF, 48, No. 1,1965; ZhTF,35, No.10,1965) and a dispersion equation is derived from it in the geometric optics approximation. The stability condition is derived and an approximate expression is obtained for the logarithmic increment of the oscillations. It was found that the plasma is unstable over a much wider range of velocity gradient than was concluded by Harrison and Stinger, who neglected drift. The solution is obtained and discussed in detail for

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L 13452-66
ACC NR: AP6002435

the case in which the plasma density is constant for $|x| < a$ and zero for $|x| > a$, and the z-component of the velocity is a linear function of x (x, y, z are rectangular Cartesian coordinates with the z-axis parallel to the uniform magnetic field). This solution reduces to that of Harrison and Stinger (loc.cit.) in the limit of high magnetic field, when drift is negligible, and gives the previous results of the present paper in the limit of short wavelength, when the geometric optics approximation is valid. Experiments, possibly by A.M.Stefanovskiy (reference not given), on inductive acceleration of plasma in a toroidal chamber are discussed. Under the conditions of the experiment the plasma was subject to the long wavelength instability previously discussed by Mikhaylovskiy (loc. cit.), but this instability develops too slowly to account for the observed rapid saturation of the current in $\sim 10^{-8}$ sec. The short wavelength instability discussed in the present paper was also active in the experimental conditions, however, and develops sufficiently rapidly to account for the observed results. Orig. art. has: 20 formulas.

SUB CODE: 20 SUBM DATE: 16Apr65 ORIG. REF: 004 OTH REF: 005

Card 2/2

L 31828-65 EWT(l)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EWA(m)-2 Po-4/Pi-4/Pz-6/
Pab-10 IJP(c) AT

ACCESSION NR: AP5004416 S/0056/65/048/001/0380/0382

AUTHOR: Mikhaylovskiy, A. B.

TITLE: Current-convective instability of collisionless plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 380-382

TOPIC TAGS: plasma instability, plasma interaction, plasma beam instability, plasma

ABSTRACT: The author shows that the instability observed by B. B. Kadomtsev and O. V. Nedospasov (J. Nucl. Energy, v. 1, 230, 1960) when current flows through a plasma, and called by them current-convective instability, can occur not only in the case of frequent collisions, discussed in the earlier paper, but in the case when the collisions between particles are not important. An equation is derived in the magnetohydrodynamic approximation for this type of instability, assuming the ion temperature to be zero and the electron motion to correspond to the drift approximation. The frequency region of the instability extends up to the ion cyclotron

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ACCESSION NR: AP5004416

frequency. A comparison of the experimental results obtained by Nezlin and Solntsev (ZhETF v. 41, 1015, 1961; v. 45, 840, 1963; v. 46, 36, 1964) yields qualitative agreement with the results of this paper and gives grounds for assuming that the anomalous effects observed by these authors are also connected with the current-convective instability analyzed in this paper. "I am grateful to B. B. Kadomtsev for a discussion of the results." Orig. art. has: 5 formulas. [02]

ASSOCIATION: None

SUBMITTED: 20Nov64 ENCL: 00 SUB CODE: ME

NO REF SOV: 003 OTHER: 001 ATD PRESS: 3200

ord 2/2

L 3450-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT

ACCESSION NR: AP5016573 UR/0056/65/048/006/1787/1795

AUTHORS: Mikhaylovskiy, A. B.; Pashitskiy, E. A.

TITLE: Surface waves on a current-carrying plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 6, 1965, 1787-1795

TOPIC TAGS: inhomogeneous plasma, plasma flow, plasma electromagnetic wave, plasma oscillation, plasma structure, plasma wave propagation

ABSTRACT: The authors analyze surface oscillations in a bounded cold plasma in which streams of charged particles move along the direction of the constant magnetic field. General boundary conditions are derived, making it possible to consider not only exchange perturbations of the plasma, but also surface perturbations. The plasma boundary is assumed to be sharp, such that the wavelength of the oscillations is much larger than the thickness of the transition layer. General boundary conditions for joining the solutions on this layer are derived, and are used to obtain the dispersion equations for the oscillations

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L 3450-66

ACCESSION NR: AP5016573 9

In various particular cases. . The dielectric constant of the cold inhomogeneous plasma with the particle streams is calculated. It is shown that oblique surface waves (in which the wave vector in one direction is much larger than in the other) become unstable in the presence of particle streams, thus causing the plasma boundary to spread out. This plasma instability leads to plasma convection transverse to the magnetic field and to a smearing of the sharp boundary. The particular cases considered are potential surface waves, nonpotential oscillations when the thickness of the skin layer exceeds the thickness of the boundary layer, and surface waves in a dense plasma when the skin layer is smaller than the boundary layer. [We thank Academician M. A. Leontovich who called our attention to this set of problems, and B. B. Kadomtsev and V. D. Shafranov for useful discussions.] Orig. art. has: 37 formulas

ASSOCIATION: None

SUBMITTED: 27Jan65 ENCL: 00 SUB CODE: ME

NR REF SOV: 006 OTHER: 000

BVK
Card 2/2

L 46329-65 EWT(1)/EPF(n)-2/EWG(m)/EPA(w)-2 Pi-4/Po-4/Pz-6/Pab-10 IJP(c)
WW/AT

ACCESSION NR: AP5009217 S/0020/65/161/001/0081/0083

AUTHOR: Mikhaylovskiy, A. B.; Pashitskiy, E. A.

TITLE: Kinetic current instability of Alfven waves in a plasma with finite ion Larmor radius

SOURCE: AN SSSR. Doklady, v. 161, no. 1, 1965, 81-83

TOPIC TAGS: plasma instability, current instability, Alfven wave, Larmor radius, kinetic instability

ABSTRACT: The authors analyze the kinetic Alfven-wave current instability which is produced in plasma with finite Larmor radius when the velocities of relative motion of the electrons and the ions exceed the Alfven velocity. Whereas in the ordinary hydrodynamic analysis of the Alfven oscillations their electric field is directed transversely to the constant magnetic field, so that there is no interaction between the wave and the particle, the situation changes if the finite Larmor radius of the ions is taken into account, for then the Alfven waves can interact with resonant particles (electrons) and can either attenuate (Landau damping) or build up (current instability). If the Alfven oscillations interact

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ACCESSION NR: AP5009217

2

with cyclotron harmonics, the increment of the current instability with a frequency close to an integer multiple of the cyclotron frequency of the ions can be appreciably larger than the increment of the potential cyclotron oscillations. "We thank B. B. Kadomtsev for a discussion of the results and useful advice." This report was presented by M. A. Leontovich. Origi art. has: 10 formulas.

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova (Institute of Atomic Energy)

SUBMITTED: 15Sep64 ENCL: 00 SUB CODE: ME

NR REF SOV: 002 OTHER: 002

Card 2/2

L 14851-66 EWT(l)/EWC(f)/EWG(m) LJP(c) AT

ACC NR: AP6001724 SOURCE CODE: UR/0020/65/165/004/0796/0799

AUTHORS: Mikhaylovskiy, A. B.; Pashitskiy, E. A.

ORG: Institute of Atomic Energy im. I. V. Kurchatov (Institut atomnoy energii)

TITLE: High frequency drift instability of a plasma

SOURCE: AN SSSR. Doklady, v. 165, no. 4, 1965, 796-799

TOPIC TAGS: plasma instability, inhomogeneous plasma, plasma oscillation

ABSTRACT: The authors analyze the high frequency instability which can be produced in a plasma by local differences in the electron temperature. The ratio or the Larmor radius of the ions to the characteristic dimension of the local inhomogeneity of the plasma (ρ_i/a) is not assumed small, as in earlier investigations, and the frequencies of the oscillations are assumed to exceed greatly the Larmor and the Langmuir ionic frequencies, so that the motion of the

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L 14851-66 3

ACC NR: AP6001724

ions does not influence the oscillations. Solution of the differential equations for the electronic oscillations of such a plasma, obtained in the optical approximation, for the case of the nonuniformly heated plasma with Maxwellian electron velocity distribution function and for the case of a mixture of two Maxwellian electron plasma with two different (constant) temperatures, shows that the high frequency instability under consideration is similar to the low-frequency drift instabilities investigated by various authors earlier. The stability limits of the two types of plasma are established. This report was presented by Academician M. A. Leontovich. Authors thank B. B. Kadomtsev and A. V. Timofeyev for a discussion of the results and M. V. Nezlin for useful discussions. Orig. art. has: 2 figures and 11 formulas.

SUB CODE: 20/ SUBM DATE: 05Mar65/ ORIG REF: 007/

Card 2/2 BC

L 21567-66 EWT(1)/EPF(n)-2/EWG(m) LJP(c) AT

ACC NR: AP6008749 SOURCE CODE: UR/0386/66/003/006/0247/0250

AUTHOR: Mikhaylovskiy, A. B.; Taypin, V. S. B47

ORG: Institute of Atomic Energy im. I. V. Kurchatov (Institut atomnoy energii)

TITLE: High-frequency instability of a plasma in a radial electric and longitudinal magnetic field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 6, 1966, 247-250

TOPIC TAGS: plasma heating, plasma instability, plasma charged particle, ion temperature

ABSTRACT: The purpose of the investigation was to check whether the ion heating observed in experiments on plasma in crossed fields (M. S. Ioffe et al., ZhETF v. 39, 1602, 1960) can be due to instabilities that cannot be described by the adiabatic theory. To this end the authors consider an idealized problem in which a plasma with low particle temperature is situated in mutually perpendicular static electric (radial) and magnetic (longitudinal) fields, and is subject to a potential perturbation of the electric field. The behavior of such a plasma is described in terms of two-fluid hydrodynamics and is analyzed for unstable oscillations in two cases, when the plasma density gradient is not too high, and when the plasma inhomogeneity is strong. The following interpretation is offered for the ion heating in the experiments of Ioffe et al.: The centrifugal force resulting from the finite mass of the ions causes the

Card 1/2

L 21567-66
ACC NR: AP6008749

electrons and ions to drift in the crossed fields with different velocities. The relative motion of the plasma components leads to an instability, whose increment is comparable with or larger than the ion-cyclotron frequency, and with a maximum of the order of the ion Langmuir frequency. The instability develops until the ion velocities due to the fluctuating fields become of the same order as the difference between the electron and ion drift velocities. Owing to the random phases of the fluctuations, the energy acquired in this manner is retained by the particles even after the electric field that had initiated the instabilities is switched off. Although the ion acceleration may possibly be connected with some other instability which lies beyond the sope of the assumed theoretical model, the instability considered by the authors can have a bearing also on other experiments, in which the radial electric field is produced artificially or spontaneously. Orig. art. has: 1 formula.

SUB CODE: 20/ SUBM DATE: 03 Feb66/ ORIG REF: 002

Card 2/2 UDC

L 22412-66 EWT(1)/EPF(n)-2/EWG(m) IJP(c) AT
ACC NR: AP6007942 SOURCE CODE: UR/0089/65/020/002/0103/0106

AUTHOR: Mikhaylovskiy, A. B.

ORG: none

TITLE: Convective effects in a plasma with beams

SOURCE: Atomnaya energiya, v. 20, no. 2, 1966, 103-106

TOPIC TAGS: plasma beam, plasma instability, plasma heating, plasma oscillation

ABSTRACT: The article summarizes some of the earlier results by the author (ZhETF v. 48, 380, 1965 and others), and describes the principal ideas and some results of the presently developing theory of convective effects that accompany the passage of electron beams through a plasma. Plasma instabilities whose development is greatly influenced both by the presence of directed particle motion and by the transverse inhomogeneity of their distribution function are briefly reviewed. It is pointed out that the convective buildup of

Card 1/2 UDC: 533.9

L 22412-66
ACC NR: AF6007942

plasma oscillations by an inhomogeneous beam differs from drift instability in several respects, and these differences are briefly discussed. The connection between convective instability and two-stream instability is also discussed. The main mechanism of convective instability is shown to be the convection of charges transverse to the disturbed electric and main magnetic fields. The wave vector of the unstable oscillations is directed almost transversely to the magnetic field, so that an important role is played here by the ion motion. Interaction with such oscillations can cause the ions to draw a large fraction of the beam energy. This may be the reason for the experimentally observed appreciable heating of the ions when a space-limited beam of electrons passes through a plasma. The possibility that convection is the cause of instability observed in other experiments is also discussed. Orig. art. has: 11 formulas.

SUB CODE: 20/ SUBM DATE: 03Aug65/ ORIG REF: 013/ OTH REF: 003

Card 2/2

L 23106-66 EWT(1)/ETC(f)/EPF(n)-2/EWG(m) IJP(c) AT

ACC NR: AP6007066 UR/0057/66/036/002/0205/0218

AUTHOR: Mikhaylovskiy, A.B.; Pogutse, O.P.

ORG: none

TITLE: Kinetic theory of the oscillations of a nonuniform plasma with collisions taken into account

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 2, 1966, 205-218

TOPIC TAGS: plasma instability, nonuniform plasma, plasma magnetic field, kinetic equation, collision, dielectric susceptibility, dispersion equation

ABSTRACT: The authors generalize their earlier work on the drift and drift-cyclotron instabilities of a nonuniform plasma (DAN SSSR, 156, 64, 1964; ZhETF, 47, 941, 1964) to include oscillations of arbitrary form. The treatment is based on the kinetic equation with the collision integral in the form given by E.P.Gross and M.Krook (Phys.Rev.,102, 593,1956). The fully ionized plasma is assumed to be located in a cylindrically symmetric magnetic field of such strength that the ratio of the collision frequency to the Larmor frequency is small, and this ratio is employed as an expansion parameter for an approximate solution of the kinetic equation. The plasma temperature is assumed to be uniform, but effects of density gradient and curvature of the magnetic lines of force are included. Under these conditions the

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ACC NR: AP6007066

dielectric tensor of the plasma and the dispersion equation are derived, and the dispersion equation is simplified for the two limiting cases that the ratio of the kinetic to the magnetic pressure is large or small. The effect of collisions on the drift instability is discussed at some length. In the final section of the paper the kinetic equation is approximately solved and the dispersion equation is derived for a weakly ionized plasma carrying a longitudinal current and, the current-convective instability is discussed. Orig. art. has: 66 formulas and 1 figure.

SUB CODE: 20 SUBM DATE: 12Jul65 ORIG. REF: 006 OTH REF: 002

Card 2/2 ULR

L 33418-66 EWT(1)/ETC(f) IJP(c) AT SOURCE CODE: UR/0057/66/036/005/0763/0776

ACC NR: AP6015297 (A, N)

AUTHOR: Mikhaylovskiy, A. B.; Pashitskiy, E. A.

ORG: none

TITLE: Convective excitation of ionic oscillations of a plasma by a nonuniform electron beam

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 5, 1966, 763-776

TOPIC TAGS: plasma oscillation, electron beam, instability, plasma wave, ion

ABSTRACT: The authors discuss the excitation of ionic oscillations in cylinder of homogeneous plasma in a uniform axial magnetic field by an inhomogeneous electron beam moving along the axis. Transverse velocities of the beam electrons are neglected, and it is assumed that the derivative of the distribution function of the beam electrons with respect to the longitudinal velocity is negative, so that the usual beam instability (Ya.B.Faynberg, Atomnaya energiya, 11, No. 4, 1961) does not occur. It is found that the beam can, nevertheless, give rise to ionic oscillations in the plasma by a convective mechanism, provided the beam density varies in the transverse direction. In the present paper detailed calculations are given for a beam whose density is a Gaussian function of the distance from the axis. The calculations are based on the kinetic equation, and it is assumed that the ratio of the maximum beam density to

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ACC NR: AP6015297

the plasma density is small. It is found that both slow beams (beam velocity lower than the thermal velocity of the plasma electrons) and fast beams can give rise to a variety of ionic oscillations with frequencies ranging from far below the ion Larmor frequency to the hybrid frequency. Conditions are found for the excitation of different types of ionic oscillations and expressions are derived for the logarithmic increments of the different oscillations. The ionic oscillations excited by a slow beam are localized in the region of the beam, whereas those excited by a fast beam may propagate throughout the plasma. Orig. art. has: 57 formulas and 3 tables.

SUB CODE: 20/ SUBM DATE: 20Jul65/ ORIG REF: 006/ OTH REF: 000

Card 2/2 UR

L 33417-66 EWT(1)/ETC(f) IJP(c) AT

ACC NR: AP6015298 (A, N) SOURCE CODE: UR/0057/66/036/005/0777/0790

59

AUTHOR: Mikhaylovskiy, A. B.; Yungvirt, K.

ORG: Institute of Plasma Physics, Prague, ChSSR (Instituta fiziki plazmy)

TITLE: On the role of convective effects in the excitation of electronic oscillations in a plasma by a bounded beam

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 5, 1966, 777-790

TOPIC TAGS: plasma oscillation, electron beam, plasma instability, plasma wave

ABSTRACT: The authors discuss the excitation of electronic oscillations in a homogeneous plasma cylinder in a uniform axial magnetic field by an inhomogeneous electron beam moving on the axis. Particular attention is given to excitation of oscillations that do not have axial symmetry; in this case there is effective a mechanism that does not come into play in the axially symmetric case and that involves radial drift of the beam electrons in the azimuthal electric field of the oscillations and the external magnetic field. The calculations are based on the kinetic equation of Vlasov, and only those oscillations are discussed whose frequencies are high compared with the ionic Larmor and Langmuir frequencies. Conditions for stability of the plasma are found and expressions are derived for the logarithmic increments of different instabilities with different assumptions concerning the velocity distribution

UDC: 533.951

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...the beam electrons. When the transverse velocities of the beam electrons are finite, the convective mechanism contributes to the instability not only in the case of Cherenkov interaction between the particles and waves, but also in the case of the anomalous and normal Doppler effects. In addition to beams with square, Maxwellian, and delta-function velocity distributions, a beam is discussed in which the electrons rotate about the axis of the plasma cylinder. In the case of a very narrow beam of this type the usual convective effects play no role, but there appear instabilities that are due to another mechanism which has not yet been adequately studied. Orig. art. has: 57 formulas.

SUB CODE: 20/ SUBM DATE: 26Jul65/ ORIG REF: 008/ OTH REF: 000

L 33292-66 EWT(1) IJP(c) AT
ACC NR: AP6014044 SOURCE CODE: UR/0056/66/050/004/1036/1047

AUTHORS: Mikhaylovskiy, A. B.; Yungvirt, K. 47 B

ORG: [Yungvirt] Institute of Plasma Physics, Prague (Institut fiziki plazmy)

TITLE: Quasilinear transformation of waves in an inhomogeneous plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 4, 1966, 1036-1047

TOPIC TAGS: nonlinear plasma, plasma beam interaction, plasma density, plasma electron oscillation, INHOMOGENEOUS PLASMA

ABSTRACT: This paper is essentially the nonlinear extension of the linear theory of the interaction between a plasma and a spatially inhomogeneous electron beam presented by the authors in an earlier paper (ZhETF v. 36, 777, 1965). All the basic assumptions and the notation are the same as in the earlier paper. In particular, it is assumed that the ratio of the beam density to the density of the cold plasma is a small quantity and that the dimensions of the beam are smaller than the radius of the cylinder. The analysis is restricted to irrotational electron plasma oscillations. A new feature in the treatment is the introduction of convective (drift) effects. Energy transfer from high to low frequencies is investigated for a system consisting of a cold

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ACC NR: AP6014044 O

system pierced by a thin electron beam, of transverse dimension a, moving along the axis of the plasma cylinder of radius R located in a longitudinal magnetic field. The basic equations of the quasilinear approximation for this inhomogeneous system are first derived and the time integrals calculated. The quasilinear pumping of energy from the high frequency into the low-frequency oscillations is then evaluated under the assumption that the original beam distribution function is a broad step previously produced as a result of smearing of the δ-function beam. The total initial energy of the high-frequency oscillations is estimated to be of the same order as the kinetic energy of the beam, and it is shown that for sufficiently high initial amplitude of the high-frequency oscillations, most of the energy is converted into low-frequency energy. This is followed by analysis of a later stage in the growth of the low-frequency oscillations and the relaxation of the beam distribution function. It involves damping of the low-frequency oscillations, which compensates for the excitation of these oscillations by the spatially inhomogeneous beam. The effect of the beam spreading on the growth of the low-frequency oscillations is estimated. It is concluded that the frequency conversion in the plasma can be lead to a substantial reduction of the energy of the plasma oscillations. Orig. art. has: 50 formulas.

SUB CODE: 20/ SUBM DATE: 01Nov65/ ORIG REF: 005/ OTH REF: 001

Card 2/2

ACC NR: AF6033403 SOURCE CODE: UR/0057/66/036/010/1731/1736

AUTHOR: Mikhaylovskiy,A.B.; Pashitskiy,E.A.

ORG: none

TITLE: Instability of the relative motion of spatially separated electron streams in a magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 10, 1966, 1731-1736

TOPIC TAGS: electron plasma, inhomogeneous plasma, plasma magnetic field, plasma stability, plasma electron temperature, dispersion equation

ABSTRACT: The authors discuss the stability with respect to long wavelength potential oscillations of two plasma sheets of finite thickness which meet in a thin plane transition layer and are located in a homogeneous magnetic field parallel to their plane. The wavelength of the perturbation is assumed to be long compared with the electron Larmor radius and the thickness of the transition layer, and the perturbation frequency is assumed to be low compared with the electron Larmor frequency. The motion of the ions is neglected. The calculations are based on the linearized Vlasov equation for the perturbed electron distribution function. A dispersion equation for the long wavelength oscillations is obtained with the aid of the boundary conditions for the electric potentials at the outer boundaries of the two plasma sheets (assumed to be conducting planes) and the condition for matching the potentials

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ACC NR: AP6033405

attthe boundary between the plasmas (derived by integrating Poisson's equation across the transition region). The dispersion equation is employed to derive stability conditions and expressions for the logarithmic increment in the case of instability, for cold plasma sheets carrying electron currents in opposite directions parallel to the applied magnetic field and for hot plasma sheets with no currents but different electron temperatures. It is found that the current carrying plasma sheets are not necessarily stable when the external magnetic field is sufficiently strong, as was asserted by Harrison and Stringer (Proc. Phys. Soc., 82, 700, 1963), but that an additional condition is required for stability, which is violated in the case of long wavelength perturbations propagating nearly transversely to the magnetic field. Orig. art. has: 25 formulas.

SUB CODE: 20 SUBM DATE: 02Oct65 ORIG.REF: 004 OTH REF: 002

Card 2/2

ACC NR: AP6037072 SOURCE CODE: UR/0056/66/051/ 5/1430/1444

AUTHOR: Mikhaylovskiy, A. B.; Fridman, A. M.

ORG: Novosibirsk State University (Novosibirskiy gosudarstvennyy univer tet)

TITLE: Drift waves in a finite pressure plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 5, 1966, 1430-1444

TOPIC TAGS: plasma wave, plasma instability, plasma temperature, inhomo neous plasma

ABSTRACT: This is a continuation of earlier work dealing with local "mi roscopic" instabilities of a finite-pressure plasma (ZhETF v. 45, 1566, 1963 and e ewhere), and the calculations are made without some of the simplifying assumption of the earlier work. The results of a recent analysis (ZhTF v. 37, no. 6, 196 are used to show that, in an inhomogeneous collisionless plasma at arbitrary pres re, just as in a uniform plasma, there are two wave modes which are the analogs o the magnetosonic and the Alfven waves. When the angle between the wave vector and t e magnetic field is close to 90°, the dispersion relations are determined by the inh mogeneity of the plasma and the magnetic field. At other propagation angles, the o cillations become the usual magnetosonic and Alfven waves. It is shown that, as in homogeneous plasma, there is no interaction between the resonant particles and the Alfven waves in the approximation in which the ion Larmor radius is taken to be zero. However, these waves can be associated with a hydrodynamic instability if the plasma

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ACC NR: AP6037072

pressure is comparable with that of the magnetic field and if the temperature and density gradients are in opposite directions. In the case of the magnetosonic waves, an analysis of the instabilities shows that in general a finite value of the pressure exerts a stabilizing effect, although in some cases excitation of the magnetosonic waves is possible. It is also shown that certain new plasma instabilities arise when the relative temperature gradient is comparable to or greater than the density gradient and is opposite in sign. The ion temperature instability of such a plasma is discussed and it is shown that this instability disappears when the plasma pressure is greater than the magnetic pressure. From the point of view of plasma stability theory, the most interesting result concerns drift magnetosonic waves, especially those associated with the ion temperature instability in the plasma. Instabilities can also be a result of oscillations that are sensitive to magnetic drift velocity of the particles. Orig. art. has: 1 figure and 51 formulas.

SUB CODE: 20/ SUBM DATE: 30Apr66/ ORIG REF: 023/ OTH REF: 001

Card 2/2

MIKHAYLOVSKAYA, Ye. P.

USSR.

Use of tetramethylthionine chloride (methylene blue) in gravimetric determination of zinc. E. P. Mikhaylovskaya, B. A. Platunov and Gosudarst. Univ. No. 109, *Uchenye Zapiski Leningrad* (1953); *Referat. Zhur., Khim.* 1954, No. 32305.—Zn was quantitatively pptd. with methylene blue in the presence of excess SCN^-, apparently as $[C_{16}H_{18}N_3S]_2[Zn(SCN)_4]$. To 10 ml. of soln. contg. 11 mg. of Zn add 10 ml. concd. HCl and 9.00 g. CH_3COONH_4, heat to boiling, add 16 ml. of 1% aq. methylene blue soln., bring to boil, and ppt. by adding 5 ml. 10% NH_4SCN soln. keeping the entire vol. 100 ml. Filter the hot soln., wash the ppt. with hot H_2O to which 2 ml. HCl is added, ignite and weigh as ZnO. Ca and Al do not interfere. In connection with it methyl red or methyl orange can be used. Fe^{+++} interferes with the detn. of Zn. M. Hoseh

L 13871-66 EWT(1)/EWP(e)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/AT/WH
ACC NR: AP5028146 SOURCE CODE: UR/0077/65/010/006/0450/0451

AUTHOR: Kostyshin, M. T.; Mikhaylovskaya, Ye. V.; Sandul, G. A.; Romanenko, P. F.

ORG: Institute of Semiconductors AN UkrSSR (Institut poluprovodnikov AN UkrSSR)

TITLE: Photosensitivity of thin semiconductive layers 36

SOURCE: Zhurnal nauchnoy i prikladnoy fotografii i kinematografii, v. 10, no. 6, 1965, 450-451

TOPIC TAGS: photosensitivity, visible light, semiconducting material

ABSTRACT: CuCl was found to have the same photosensitivity properties as are exhibited by PbI_2. When deposited in thin layers on quartz or glass, these compounds form latent images upon exposure to visible light. These images may be developed on heating. Temperatures required are 180-240°C for PbI_2 and 150-200°C for CuCl. If heated to these temperatures during exposure, the latent images appear on subsequent exposure to radioactivity. The source of light may also serve as the source of heat in developing the latent image. It was shown that other halides are also light sensitive. Compounds of sulfur (As_2S_3, Sb_2S_3, CdS, PbS), selena (As_2Se_3) and

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ACC NR: AP5028146

tellurite (ZnTe) are similarly photosensitive. Light sensitive layers are produced by vacuum deposition at pressures on the order of 10^{-4}-10^{-5} cm Hg. The layers are exposed for a period of from a few minutes to an hour. They are then heated in an oven for from 5-10 minutes, at temperatures between 100°C and 200°C. The reaction apparently takes place as a result of the rupture of the electronic bonds of CuCl. The cuprous and chloride ions react in pairs in the defects of the crystal lattice and form molecules of chlorine and copper. The atoms of copper are trapped in the lattice forming the resultant visible image. Heating accelerates the rupture of the bonds of CuCl. By selecting appropriate semiconductive material, layers can be produced which are sensitive to various portions of the spectrum. Applications may be found in microphotography. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 25Jun65/ ORIG REF: 000/ OTH REF: 003

Card 2/2 mc

MIKHAL[illegible]VSKIY, A. G.

25710 MIKHALOVSKIY, A. G. Vliyaniye Razmeshcheniya Rastoniy v Ryadkakh na Razvitiye i urozhay. zernovykh Kul'tur. Sov. Agronomiya, 1948, No. 7, S. 72-76.

SO: Letopis' Zhurnal Statey, No. 30, Moscow, 1948.

MIKHAYLOVSKIY, A. G.

USSR

Treating seed with solutions of microelements prior to planting. A. G. Mikhailovskii and M. M. Sopilnyak. *Zemledelie* 2, No. 7, 49-53(1954); cf. *C.A.* 47, 714i. — $CuSO_4$ 0.01%, and 0.05% $MnSO_4$ solns. applied to grain, at a rate of 35 l./100 kg. of grain seed, stimulated germination, with the Mn being slightly more effective than the Cu. Length of rootlets after the first few days of growth was stimulated considerably by the Mn, but Cu had practically no effect. $MnSO_4$ at a concn. of 0.05% was more effective than at 0.01%. Tillering and quantity of sugars, prior to entering the dormant winter season, was higher in the Cu- and Mn-treated plants. Chlorophyll content during winter, spring, and summer was higher in Cu- and Mn-treated plants. There was no change in the osmotic pressure of the cell sap in the seed-treated plants. Viscosity of the cell plasma increased and H_2O content decreased on seed-treated plants prior to entering the dormant winter season. This condition increases resistance against frost injury. Loss of plants because of winter killing was 65% in the pots of the nontreated plants, 16.7% in the Cu-, and 19.5% in the Mn-treated wheat seed. In field expts. covering 6 ha. the yield of the controlled area was 17.5 centners/ha.; the $CuSO_4$-treated seed gave 20.3 centners/ha. S. L.

REMPEL', Aron Iosifovich, inzh.; PEREL'MAN, Yuriy Zalemanovich, inzh.; MI-KHAYLOVSKIY, Aleksandr Moiseyevich, inzh.; RAKHMATULIN, M.D., retsenzent; VUL'F, V.V., inzh., red.; BOBROVA, Ye.N., tekhn. red.

[Repairing the cylinder-piston system of the 2D100 diesel engine; practices of the Tashkent Diesel Locomotive Depot] Remont tsilindro-porshnevoi gruppy dizelia 2D100; iz opyta Tashkentskogo teplovoznogo depo. Moskva, Vses. izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniia, 1961. 38 p. (MIRA 14:7)
(Diesel engines--Maintenance and repair)

OSIKA, K.P., inzh.; MIKHAYLOVSKIY, A.M., inzh.

Use of polyvinyl chloride pipes in 2D100 diesel locomotives. Elek. i tepl. tiaga 7 no.4:19 Ap '63. (MIRA 16:5)
(Diesel locomotives) (Pipe, Plastic)

ZHUK, A.M., inzhener, nachal'nik dinamometricheskogo vagona (Kiyev)
MIKHAYLOVSKIY, A.N. (Kiyev)

Modernizing the cone exhaust apparatus of steam locomotives.
Zel.dor.transp. 39 no.4:70-72 Ap '57. (MLRA 10:5)
(Locomotives)

MIKHAYLOVSKIY, Aleksey Viktorovich; KANEVSKAYA, M.D.; BLAZHENKOVA, G.I., tekhn.red.

[Training puppies; advice to beginners in dog raising] Vospitanie shchenka; sovety nachinaiushchemu sobakovodu. Moskva, Izd-vo DOSAAF, 1958. 46 p. (MIRA 12:9)
(Dogs--Training)

22(3) SOV/174-58-5-36/37

AUTHOR: Mikhaylovskiy, A.V., Colonel

TITLE: Fire Without Adjustment in the Mountains and on the Seashores (Strel'ba bez pristrelki v gorakh i na poberezh'ye)

PERIODICAL: Artilleriyskiy zhurnal, 1958, Nr 5, pp 60-62 (USSR)

ABSTRACT: Mountain firing, according to the author, is a firing across the valleys, from the valley over the ridge, from mountain passes into the canyons, etc. Meteorological conditions for such firing is of great importance, namely the wind blows irregularly in different directions at different levels. A sketch (Nr 1) of the wind is given. Weather balloons are of little help in these conditions and artillery fire preparations are of lesser importance, but fire adjustment must be carried out. Similar conditions exist at seashores especially when firing from shore to the targets at sea. This is

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Fire Without Adjustment in the Mountains and on the Seashores

because of the different air temperatures over the shore and over the sea. Adjustment of fire is also recommended. There are 3 sketches.

SOV/86-59-1-22/59

AUTHOR: Mikhaylovskiy, A.V., Reserve Col, Candidate of Technical Sciences

TITLE: Determining the Ballistic Windage for Bombing (Opredeleniye ballisticheskogo vetra dlya bombometaniya)

PERIODICAL: Vestnik vozdushnogo flota, 1959, Nr 1, pp 54-57 (USSR)

ABSTRACT: The author suggests that Air Force units obtain ballistic windage data from bulletins of artillery meteorological stations. Such data can be supplied to air crews in the form of a special table prior to takeoff or transmitted to them by radio during flight. This facilitates the work of navigators in the air, because ballistic windage data obtained from the artillery meteorological bulletin can be used successfully for bombing targets in forward areas. If such bulletins are not available, Air Force meteorologists can themselves find the ballistic windage by processing pilot balloon data on the basis of instructions set forth in the manual of the meteorlogical service for artillery.

Card 1/1

BERMAN, I.A.; MIKHAYLOVSKIY, B.G.

Combined stomatological X-ray screen. Stomatologiia 35 no.4:59-60 Jl-Ag '56 (MLRA 10:4)
(X RAYS IN DENTISTRY)

MIKHAYLOVSKIY, B.G.

Total body roentgenography of man as a method of functional analysis of the spine. Khirurgiia 33 no.8:27-33 Ag '57. (MIRA 11:4)

1. Iz Kiyevskogo rentgeno-radiologicheskogo nauchno-issledovatel'skogo instituta (dir.-prof. I.T. Shevchenko) i kafedry rentgenologii i radiologii (zav. B.G. Mikhaylovskiy) Kurskogo meditsinskogo instituta (dir.-prof. A.V. Savel'yev)
(SPINE, radiography
total body x-ray for exam. of spinal funct. in norm & dis.)

MIKHAYLOVSKIY, B.G.

Transverse tomography in examination of the spine [with summary in English]. Vest.rentg. i rad. 33 no.1:55-58 Ja-F '58. (MIRA 11:4)

1. Iz Kiyevskogo rentgeno-radiologicheskogo nauchno-issledovatel'skogo instituta (dir.-prof. I.T. Shevchenko) i kafedry rentgenologii i radiologii (zav. B.G. Mikhaylovskiy) Kurskogo gosudarstvennogo meditsinskogo instituta (dir.-prof. A.V. Savel'yev).
(SPINE, radiography
transverse tomography (Rus)

MIKHAYLOVSKIY, B. G., Doc Med Sci (diss) -- "X-ray diagnosis of anomalies and variants in the development of the spine (X-ray-anatomical and clinical-X-ray investigation)". Leningrad, 1959. 23 pp (Min Health USSR, Central Sci Res Roentgenological and Radiological Inst), 200 copies (KL, No 20, 1959, 115)

MIKHAYLOVSKIY, B. G. (Kursk)

Roentgen diagnosis of some anomalies and variations in the development of the spine during the middle and later stages of embryogenesis. Arkh. pat. no.12:41-45 '61. (MIRA 15:7)

1. Iz kafedry rentgenologii i radiologii (zav. - prof. B. G. Mikhaylovskiy) Kurskogo meditsinskogo instituta (dir. - prof. A. V. Savel'yev)

(SPINE--ABNORMITIES AND DEFORMITIES)
(SPINE--RADIOGRAPHY)

MIKHAYLOVSKIY, Boris Georgiyevich; MANIKOV, M.Ye., red.; ROMANOVA, Z.A., tekhn. red.

[X-ray diagnosis of spinal diseases] Rentgenodiagnostika zabolevanii pozvonochnika. Moskva, Medgiz, 1963. 259 p. (MIRA 16:9)

(SPINE—DISEASES)
(DIAGNOSIS, RADIOSCOPIC)

35100
S/185/62/007/001/010/014
D299/D302

26.2532

AUTHOR: Mykhaylovs'kyy, Z. I.

TITLE: Electron and ion emission of certain materials used in thermoelectronic energy-converters

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 1, 1962, 75 - 77

TEXT: Materials ThO_2, ZrC and LaB_6 were used as cathodes in thermoelectronic energy converters and their emission properties studied. For this purpose, experimental lamps (diodes), filled by cesium vapor, were prepared. The cathodes were made of a thin film of the respective material, applied on a metallic base (tungsten or tantalum). The cathodes were heated to the following temperatures: ZrC - 2200, LaB_6 - 2000, and ThO_2 - 2100 to 2200°K. Then the temperature was reduced to 1500 - 1700°K. The emission constants (the work function φ and the constant A) were determined by measuring the temperature dependence of the electron and ion emission. In the first case, investigations were carried out at room temperature and

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Electron and ion emission of ...

the values of φ_e and A were determined from the graph $\lg j_e/T^2 = f(1/T)$. In the second case (ion emission), the experimental lamps were heated to 60 - 120°C ($p = 3 \cdot 10^{-5} - 1.4 \cdot 10^{-3}$ mm Hg) and the values of φ_p were determined from the graph $\lg j_p = f(1/T)$. The quantity α_p (denoting the probability of ionization of the caesium atoms at the cathode surface), was also determined. The experimental values of φ_p differed from the theoretical ones. A comparison of the latter with results for φ_e and A, with those of other investigators, shows good agreement for ThO_2 and LaB_6, and discrepancy for ZrC; it is noted that the results of various investigators were also in disagreement in the case of ZrC. From a table it is evident that in all the cases $\varphi_p < \varphi_e$. The experimental lamps were also used for studies under energy-conversion conditions. From the obtained volt-ampere characteristics the author determined the value of the short-circuit current I_s, the optimal specific power w, the corresponding voltage drop V_{opt}, and the emf of conversion ε. Conclusions: It is possible to obtain ...

Card 2/3

Electron and ion emission of ... S/185/62/007/.../.../... 2270/2302

values of W = 1 - 2 watt/cm² with cathodes having low work-functions (.3 ev.) and a considerable emission in the ... temperature-range (2000°K). The differences between ... and between the experimental and calculated values of ..., are apparently due to cathode-surface inhomogeneities. It is ... that the experimental method used, yields tentative and qualitative results only. There are 2 figures, 1 table and 6 references: 2 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: W. Danforth, J. Frankl. Inst. no. 5, 515, 1951; D. Goldwater, R. Haddad, J. Appl. Phys., 2?, 7?, 1951; G. Grover, D. Roehling, P. Salmi and Pidd, J. Appl. Phys., 29, 161, 1958; J. Lafferty, J. Appl. Phys. 22, 29?, 1951.

ASSOCIATION: Kyyivs'kyy derzhavnyy universytet im. T.H. Shevchenko (Kyyiv State University im. T.H. Shevchenko)

SUBMITTED: July 26, 1961

Card 3/3

MIKHAYLOVSKIY, B.I.; MARCHENKO, R.I.

Speed and evaporation products of a thorium carbide thermocathode. Radiotekh.i elektron. 8 no.4:680-683 Ap '63. (MIRA 16:4)

1. Kiyevskiy gosudarstvennyy universitet im. T.G.Shevchenko.
(Cathodes) (Thorium carbides)

L 13555-65 EWG(j)/EWP(e)/EWT(m)/EPF(c)/EPF(n)-2/EPR/EWP(t)/EWP(k)/EWP(b)
Pf-4/Pr-4/Ps-4/Pu-4 SSD/ASD(a)-5/ASD(d)/AS(mp)-2/ASD(m)-3/AFWL/ESD(gs)/ESD(
AT/WH/JD/JG
ACCESSION NR: AP4045309 S/0048/64/028/009/1504/1507

AUTHOR: Mikhaylovskiy, B.I.

TITLE: Electronic and ionic emission of zirconium carbide, lanthanum hexaboride and thorium oxide in cesium vapor at low pressure [Report, Tenth Conference on Cathode Electronics held in Kiev from 11 to 18 Nov 1963]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.9, 1964, 1504-1507

TOPIC TAGS: thermionic emission, cesium, zirconium compound, lanthanum compound, thorium oxide

ABSTRACT: Although zirconium carbide (ZrC), lanthanum hexaboride (LaB_6), and thorium oxide (ThO_2) are known to be good thermionic emitters at medium cathode temperatures (about 2000 K), there have been virtually no studies of their emissive behavior in alkali metal vapors, except for the preliminary investigation of their electronic and ionic emission in Cs vapor by the author (B.I.Mikhaylovskiy, Ukr.fiz.zhur. 7,75,1962). In view of the continuing interest in the electronic, ionic, and adsorptive properties of such nonmetallic substances, the investigation was continued in the present work. The emission was measured in diode-type tubes with provision for

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introducing Cs vapor and two tungsten filaments 100 microns in diameter and 220 mm long. One of these was coated with the test material, the other was left uncoated, and served as a monitor for the Cs vapor pressure, which was varied from 10^{-5} to 10^{-4} mm Hg. The cathode temperature was determined by means of a micropyrometer. A 500 oe magnetic field was employed to suppress any back electron current during ionic measurements. The resulting data are presented in the form of log i (electron or ion) versus 1/T curves for different Cs pressures (not specified at the curves). Also given are plots of P_m (optimum Cs vapor pressure) versus $1/T_m$, which are straight lines for each material; the slopes of these lines give the values of the heat of adsorption. These and the values of the work functions are tabulated. The observed peculiarities in the behavior of ZrC, LaB_6, and ThO_2 are briefly noted, and will be discussed in a future paper. "In conclusion, the author expresses his deep gratitude to N.D.Morgulis for his interest in the work and discussion of the results." Orig. art. has: 2 formulas, 3 figures, and 1 table.

ASSOCIATION: none

SUBMITTED: 00 ATD PRESS: 3131 ENCL: 00

SUB CODE: IC, EM NR REF SOV: 003 OTHER: 004

Card 2/2

MIKHAYLOVSKIY, B.M.

Therapeutic use of penicillin in anicteric leptospirosis. Vrach. delo no.4:429-431 Ap '57. (MLRA 10:7)

1. Sel'skaya rayonnaya bol'nitsa Novo-Milyatinskogo rayona, L'vovskoy oblasti.
(PENICILLIN) (LEPTOSPIROSIS)

MIKHAYLOVSKIY, B.N.

Epidemiology of anicteric leptospirosis(mud fever). Zhur.mikrobiol. epid. i immun. 29 no.9:83-86 S'58 (MIRA 11:10)

1. Iz sel'skoy rayonnoy bol'nitsy Novomilyatinskogo rayona L'vovskoy oblasti.

(LEPTOSPIROSIS, epidemiology
grippotyphosa (Rus))

MIKHAYLOVSKIY, B.N.

Clinical characteristics of swamp fever of the influenzal-typhous type. Klin.med. no.12:84-86 '61. (MIRA 15:9)

1. Iz Novomilyatinskoy sel'skoy uchastkovoy bol'nitsy (glavnyy vrach I.A. Danilyuk) Buskogo rayona L'vovskoy oblasti.
(LEPTOSPIROSIS)

MIKHAYLOVSKIY, B.N.

Effectiveness of penicillin in anicteric forms of leptospirosis (swamp fever). Klin.med. 39 no.3:50-54 Mr '61. (MIRA 14:3)

1. Iz Novomilyatinskoy sel'skoy uchastkovoy bol'nitsy L'vovskoy oblasti (glavnyy vrach I.A. Danilyuk).
(LEPTOSPIROSIS) (PENICILLIN)

MIKHAYLOVSKIY, B.N.

Significance of the soil factor in the epidemiology of anicteric leptospirosis; author's abstract. Zhur. mikrobiol., epid. i immun. 33 no.7:91-92 Jl '62. (MIRA 17:1)

1. Iz Novomilyatinskoy uchastkovoy bol'nitsy Buskogo rayona L'vovskoy oblasti.

MIKHAYLOVSKIY, B. N.

Mikhaylovskiy, B. N. -- "Investigation of the Process of Rectification of Multi-component Mixtures and the Development of an Operative Method of Calculation." Cand Tech Sci, Moscow Order of Lenin Chemicotechnological Inst imeni D. I. Mendeleyev, 27 Jan 54. (Vechernyaya Moskva, 4 Jan 54)

SO: Sum 168, 22 July 1954

MIKHAYLOVSKIY, B. N. FD 200

USSR/Chemistry - Chemical Engineering, Distillation

Card 1/1

Author : Mikhaylovskiy, B. N.

Title : An analytical method for the calculation of the process of distillation of multicomponent and binary mixtures

Periodical : Khim. prom. 4, 45-49 (237-241), June 1954

Abstract Carries out a theoretical calculation of the process of distillation according to a new procedure which deviates from the methods of calculation used hitherto. Three USSR references, all since 1940; eight foreign references. One figure.

Institution : Moscow Order of Lenin Chemicotechnological Institute imeni D. I. Mendeleyev

AUTHOR: Mikheyl[illegible] kiy, B. N

SOV/156-58-2-48/48

TITLE: [illegible] Method Used for the Computation of Theoretical Plates (Stages of Separation) for the Rectification of Double Mixtures (Krotkiy analiticheskiy metod rascheta chisla teoret.-ch-skikh tarelok (stupeney razdeleniya) dlya rektifikatsii dvoynykh smesey)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 2, pp. 392-397 (USSR)

ABSTRACT: Different methods have been applied in the determination of the number of these plates. They are either relatively complicated or they require the construction of a scale diagram. The method suggested here is characterized by its shortness and by sufficient precision. The process of separation of mixtures by means of rectification can be carried out with phlegm numbers within the range from the minimum (R_{min}) to an infinite (R_{∞}). In the case of R_{min} the necessary number of theoretical plates is ∞ while it is a minimum in the case of R_{∞}. Under practical conditions the phlegm working number (R) and the number of the plates (N) have finite values. From the equations for the mate-

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A Short Analytical Method for the Computation of Theoretical Plates (Stages of Separation) for the Rectification of Double Mixtures

the letters for the weakening (ischerpyvayushchaya) and the enriching (ukreplyayushchaya) part of the column it holds that $x_n = y_{n-1}\frac{R+1}{R} - \frac{x_D}{R}$ (1). On the basis of several computational steps (equations (2) - (6)) the author finally sets up the following equation: $\left(\frac{x}{1-x}\right)_N = \left(\frac{x}{1-x}\right)_{N-1} \cdot \alpha$ (7). It demonstrates the relation of the content of components in the liquid mixture which is taken down from the neighbouring plates N and N - 1, i.e. it expresses the relative power of the separation of the mixture on a theoretical plate. It can be seen from the equation set up in a somewhat different manner (7) namely from (7a) that this power (in the case of $R = \infty$) is equal to the relative volatility α of the mixture components (a) as well as for all plates the same and a constant). By applying the relation (7) to all theoretical plates of the column (N_{min}) within the range of the composition of the rectificate x_D up to [illegible] the decrease x_n [illegible] one obtains the generally known Fenske equation

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A Short Analytical Method for the Computation of Theoretical Plates (Stages of Separation) for the Rectification of Double Mixtures

[(6) or (8)] which determines the minimum number of theoretical plates in the case of R = ∞. The quantity R = ∞ indicates that the molar quantities of the contacting phases (of the liquid as well as of the vapor phase) are equal. In the case of R = ∞ the highest power of the separation of mixture is obtained which on each theoretical plate is equal to the component a of relative volatility. In the case of a phlegm working number R the quantities of the vaporous and liquid phases contacting each other are unequal. This causes the reduction of the power of the separation of the mixture which necessitates an increased number of theoretical plates. From this the author derives the relative power computed for the average for each plate of both parts of the column and finally the total number of the plates in the column N = n + m (13). Table 1 proves that the suggested method furnishes results which agree well with those of the usual computation methods and that it differs, however, by the shortness and the simplicity of its performance. There are 1 table and 8 references, 4 of which are Soviet.

SOV/156-58-2-48/48

A Short Analytical Method for the Computation of Theoretical Plates (Stages of Separation) for the Rectification of Double Mixtures

ASSOCIATION: Kafedra protsessov i apparatov Moskovskogo khimiko-tekhnologicheskogo instituta im. D. I. Mendeleyeva (Chair for Processes and Apparatus of the Moscow Chemical Technological Institute imeni D. I. Mendeleyev)

SUBMITTED: January 6, 1958

Card 4/4

USCOMM-DC-60413

5(1)
AUTHOR: Mikhaylovskiy, B. N. SOV/153-58-6-20/22

TITLE: The Method of Technical and Economic Calculation of Apparatus (Metodika tekhniko-ekonomicheskogo rascheta apparatov) I. Heat Exchanger (I Teploobmenniki)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya. 1958, Nr 6 pp 115-120 (USSR)

ABSTRACT: Heat exchangers belong to the apparatus the economy of which is not sufficiently taken into account Often their operation does therefore not yield sufficient results. The fields of application of these apparatus are pointed out again (Refs 1-10). After a further analysis the author draws the conclusion that a) In the case that the velocity of motion of the heat carriers in the heat exchanger can be increased by means of an increased capacity of a pump, a compressor, a ventilator, etc , the optimum velocity of the heat carriers has to be determined by means of a computation mentioned in the title; b) If there is no such connection as mentioned under a) the available energy has to be exploited to a maximum extent for the acceleration of the heat carriers. The mentioned calculation is not necessary: c) If the final tempera-

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ture of one of the heat carriers is not given and its consumption may be unlimited, or the consumption of the two heat carriers and their initial temperatures are prescribed respectively, the determination of their final temperatures is as well a problem of the economic field (Refs 5,8) The bases of calculation are: it is assumed that the consumption of the heat carriers and the temperature conditions of the heat exchange are prescribed The characteristic feature of the method of calculation is the determination of such a velocity of the heat carriers in the heat exchanger that guarantees the lowest operation costs of the latter The operation costs consist of: a) the amortization and the current repairs; b) the energy used for the movement of the heat carriers These items are analyzed by the author a) The diameter and the length of the tubes and the pressure of the heat carriers may be taken into account here Figure 1 shows the influence of these quantities on the costs of the heat exchanger. Tubes with a diameter of 3/4 " inch are the most economical ones. Figure 1 shows also three curves which demonstrate the variation of the relative costs of a heat exchanger in dependence on

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the pressure in the tubes only (Curve 1), on the pressure in the space between the tubes (Curve 2) and on the pressure in both spaces (Curve 3). Figure 1 shows finally the curve of the comparative costs of a unit of the heat transfer surface in dependence on the amount of the heat exchange. Figure 2 demonstrates a scheme of the graphic determination of the economical velocity of movement of the heat carriers. The author points out the possibility of the increase of an intensification of the heat exchange. This may be carried out by a better exploitation of the available pressure or of the pressure in the system with an additional expenditure of energy. There are 2 figures and [illegible] references, 5 of which are Soviet.

ASSOCIATION: Kafedra protsessov i apparatov, Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva (Chair of Processes and Apparatus, Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: December 2, 1957

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afore-mentioned column parts are to be calculated separately. In the rectification of many-component mixtures, for which the Raoult law holds, the composition of the flowing down liquid is nowhere similar to that of the initial mixture. However, the content of one component in any height agrees with the content of the same component in the initial mixture, whereas the agreement of the concentration was found for different components in different heights (on different plates). This difference is due to the presence of components with intermediate relative volatility (promezhutochnaya otnositel'naya letuchest') in the mixture. The following principle may be utilized for selecting the supply bottom: The supply bottom of the evaporation sector of the column is to be regarded as supply bottom with which the transition to the condensation sector guarantees a more efficient separation of the mixture, than a further extension of the evaporation sector. In this case the least possible number of plates in the column must result for the composition of the rectified

5(1)
AUTHOR: Mikhaylovskiy, B. N. SOV/153-2-1-25/25

TITLE: On the Determination of the Composition of the Mixture Flowing Down From the Feed Plate During the Rectification of Multi-component Mixtures (K opredeleniyu sostava smesi, stekayushchey s tarelki pitaniya pri rektifikatsii mnogokomponentnykh smesey)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 1, pp 141-146 (USSR)

ABSTRACT: In continuously operating rectifying columns the plate on which the initial mixture is introduced is called feed plate. (tarelka pitaniya). This is the uppermost plate of the evaporation section (ischerpyvayushchaya chast') of the column. When binary mixtures are rectified, the mixture to be separated must necessarily have the composition of the initial mixture at a corresponding height of the column. The feed plate separates the condensation section of the column from its evaporation section. This boundary must be known for determining the height (or the plate) where the supply of the initial mixture has to be introduced into the column. The two

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substance and at a given phlegm number. Further, the author investigated the variations in the concentration of the components with the height of the column by means of equations ((1) - (11)) for multi-component mixtures. He mentions the concentration limits of the most readily and the most unreadily volatile components of the mixture within the range of the feed plate . The equations were derived for determining the concentration of the components in the mixture that flows down from the feed plate , i. e. for the purpose of rectifying multi-component mixtures. Thus, also the point of introduction of the initial mixture into the column was determined. A comparison of the calculation results obtained for the mixture flowing down from the feed plate shows, according to the equations (8-11), satisfactory agreement with those of the control calculation from plate to plate. Though this control of the afore-mentioned formulas did not take into account any detail, it indicates yet the possibility to apply these formulas to approximate calculations of the

On the Determination of the Composition of the Mixture Flowing Down From the Feed Plate During the Rectification of Multi-component Mixtures SOV/153-2-1-25/25

rectification of multi-component mixtures. There are 1 table and 6 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva; Kafedra protsessov i apparatov (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev, Chair of Processes and Apparatus)

SUBMITTED: December 2, 1957

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USCOMM-DC-61190

5(4)

AUTHOR: Mikhaylovskiy, B. N. SOV/153-2-3-29/29

TITLE: On the Computation of Rectification Columns on the Basis of the Theoretical Plate and on the Basis of Transfer Units

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 3, pp 467-471 (USSR)

ABSTRACT: As is shown in the present paper, the computation of columns with plates must be based on the computation of the theoretical plates, and the computation of columns with filling material on the basis of transfer units. This holds especially for multi-component systems. Equations for the computation of distillate and reflux in the distillation of multi-component mixtures were deduced for columns with plates and for columns with filling material (Equation (4)). As was found by the computation of two examples (Table) considerable differences were partly found in the composition of the columns with plates and for columns with filling material. The author points to the fact that the considerations made hold also for the absorption and extraction processes. There are 1 table and 14 references, 7 of which are Soviet.

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On the Computation of Rectification Columns on the Basis of the Theoretical Plate and on the Basis of Transfer Units SOV/153-2-3-29/29

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva - Kafedra protsessov i apparatov (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev, Chair of Processes and Apparatus)

SUBMITTED: June 16, 1958

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USCOMM-BC-61,754

MIKHAYLOVSKIY, B.N.

Reply to V.A.Shalygin's remarks. Izv.vys.ucheb.zav.: khim.i khim. tekh. 3 no.1:210 '60. (MIRA 13:6)

1. Kafedra protsessov i appartov khimicheskikh proizvodstv Moskovskogo khimiko-tekhnologicheskogo instituta imeni D.I. Mendeleyeva.

(Distillation, Fractional)

MIKHAYLOVSKIY, B.N.

Determination of the minimum reflux-to-product ratio in the rectification of multicomponent mixtures. Izv. vys. ucheb. zav.; khim. i khim. tekh. 4 no. 2:310-313 '61. (MIRA 14:5)

1. Moskovskiy khimiko-tekhnologicheskiy institut im. D.I. Mendeleyeva. Kafedra protsessov i apparatov.
(Distillation, Fractional)

[illegible] ([illegible]), [illegible].

Det[illegible] [illegible] co[illegible] of rectified material [illegible] still by-products [illegible] the rectification of multicomponent mixt[illegible]. Trudy [illegible] no.33:[illegible]-112 '61. ([illegible] 14:1)
(Distillation)

S/081/61/000/020/042/089
B105/B101

AUTHOR: Mikhaylovskiy, B. N.

TITLE: Determination of the minimum reflux ratio in rectification of multicomponent mixtures

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 20, 1961, 243, abstract 20I43 (Tr. Mosk. khim.-tekhnol. in-ta im. D. I. Mendeleyeva, no. 33, 1961, 113-117)

TEXT: A method for determining the minimum reflux ratio (R_{min}) in rectification of multicomponent mixtures is presented. The method assumes that at R_{min} the concentration of the most volatile component in the liquid downflow from the lowest plate of the concentration section of the column is equal to its concentration in the liquid downflow from the feed plate. R_{min} is determined by the method of successive approximations. One example for the calculation of R_{min} is given. [Abstracter's note: Complete translation.]

Card 1/1

MIKHAYLOVSKIY, B.N.

Reply to the letter by V. Platonov and B. Bergo. Izv.vys. ucheb.zav.;khim.i khim.tekh. 5 no.3:514 '62. (MIRA 15:7)
(Distillation, Fractional)

MIKHAYLOVSKIY, F.N.

Some problems in calculating the mixture recirculation in a continuous action column with incomplete reflux. Trudy VKHTI no.46:119-121 '63. (MIRA 18:1)

ATAYEV, S., kand.tekhn.nauk; ZYSMAN, A., kand.tekhn.nauk; TONOYAN, A., inzh.; MIKHAYLOVSKIY, D., inzh.

Apartment houses made of prefabricated rooms. Zhil. stroi. no.7:24-26 Jl '61. (MIRA 14:8)
(Minsk--Buildings, Prefabricated) (Apartment houses)

MIKHAYSKIY, G.A.

Cutting coal costs and improving mining profit. Ugol' Ukr. 3 no.9:41-42 S '59. (MIRA 13:2)

1. Luganskiy sovnarkhoz.
(Luganskaya Province--Coal mines and mining--Costs)

SOV/120-58-4-10/30

AUTHORS: Stoyanov, P.A. Polivanov, V.V., Mikhaylovskiy, G.A.

TITLE: The UEMB-100 Electron Microscope (Magnetically Focussed) (Magnitnyy elektronnyy mikroskop UEMB-100)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 4, pp 51-60 (and 2 plates)(USSR)

ABSTRACT: The UEMB-100 (mentioned briefly in the first article in this issue) is described in full technical detail, with plates illustrating the applications. The resolution is 20 A; there are four lenses, and the magnification is continuously variable from 250 to 150,000. It is applicable to many uses, such as spectroscopy in reflection, diffraction, light- and dark-field working, etc. Fig. 1 is a general view photo of the microscope, and Fig. 2 is a cross-sectional, cut-away diagram of the same instrument. Fig. 3 illustrates the objective lens (the most important part) with 3 pages of description. Fig. 4 shows the mechanism for setting in the object pole-tips, Fig. 5 the stigmator. Fig. 6 shows the intermediate and projection lenses (built as a single unit), Fig. 7 the vacuum system, and Fig. 8 the supply system.

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The UEMB-100 Electron Microscope (Magnetically Focussed)

Figs 8 and 9 show the voltage stabilizer and heater voltage supplies respectively, Fig 11 the lens current stabilizer and Fig 12 the electronic high voltage stabilizer. Fig 14 shows colloidal gold particles, and Fig 16a diffraction pattern obtained in reflection; Fig 15 shows diffraction and microdiffraction patterns from vacuum-evaporated silver (on collodion). The paper contains 16 figures and 5 references, 4 of which are Soviet and 1 English.

SUBMITTED: August 26, 1957.

STOYANOVA, I.G.; MIKHAYLOVSKIY, G.A.

Method and apparatus for electron microscope study of moist objects. (MIRA 14:4)
Biofizika 4 no. 4:843-849 '59.
(ELECTRON MICROSCOPY)

AUTHORS: Stoyanov, P. A., Mikhaylovskiy, G. A., Moseyev, V. V. SOV/48-23-4-3/21

TITLE: The Electron Microscope UEMB-100 With Double-lens Condenser (Elektronnyy mikroskop UEMB-100 s dvukhlinzovym kondensorom)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1959, Vol 23, Nr 4, pp 442 - 449 (USSR)

ABSTRACT: The electron microscope UEMB-100 shown in figure 1 is a universal instrument making it possible to carry out investigations in the penetration and reflection procedure, microdiffractions, etc. The electron accelerator with the two condenser lenses, objective, intermediate and projective lens secure work even in the case of objects that behave unstably in the electron beam of common electron microscopes; furthermore they make it possible to vary the magnification range from 250fold up to 150000fold. The instrument features a mechanical adjusting element, as well as a stigmator for the prevention of astigmatism. The electron accelerator features tension steps of 50, 75 and 100 kv and consists of a V-shaped tungsten cathode, a focusing electrode and an anode. Figure 3 shows the double-lens condenser consisting of a long-range focusing lens and a short-range focusing one. In the focusing plane of the short-range focusing lens there is an electronic source, which is

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